DOCUMENT RESUME

ED 101 276 CS 001 561

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TITLE	Secondary Reading Descriptive Study, 1973-74.
INSTITUTION	Pinellas County District School Board, Clearwater, Fla.
PUB DATE	Aug 74
NOTE	37p.
EDRS PRICE	MF-$0.76 HC-$1.95 PLUS POSTAGE
DESCRIPTORS	*Reading Achievement; Reading Comprehension; Reading Difficulty; *Reading Instruction; *Reading Programs; *Reading Research; *Reading Skills; Remedial Reading; Secondary Education; Secondary School Students
IDENTIFIERS	Florida; Pinellas County; *Pinellas County Reading System

ABSTRACT

The purpose of this study was to provide descriptive information about the Pinellas County (Florida) Reading System (PCRS) as adapted by individual schools for selected pupils in the seventh and eighth grades. The results of this study indicate that low achieving pupils have made fluctuating but significant gains beyond normal expectations in reading in the various PCRS programs. The results justify the tentative conclusion that at least some of the gains above expectations reflect the System's impact. A definitive conclusion must be deferred until a more highly controlled study is conducted. (The data in this study are described in narrative and table form, and the mean reading scores from each of the schools in this study are included.) (RB)

ED101276

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SECONDARY READING

DESCRIPTIVE STUDY
1973-74

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August, 1974

CS 001 561

Purpose

The purpose of this study was to provide descriptive information about the effect of the Pinellas County Reading System, as adapted by individual schools for selected pupils in the 7th and 8th grades. The pupils placed in the Reading System adaptations were all identified as low-achievers in reading and in need of special instruction. The mean grade equivalent of the 7th graders entering the various programs was 4.6 in vocabulary and 4.4 in reading comprehension. The mean grade equivalent of 8th graders entering the program, both in vocabulary and comprehension, was 5.8. This report provides measures of the reading growth of these pupils subsequent to exposure to various patterns and intensities of instruction.

In addition, measures of reading growth of pupils who were average or above-average in reading are herein reported. These pupils were not provided with any special reading instruction beyond that customarily included in the ongoing curricula. The mean initial grade equivalent of the average and above-average 7th graders was 7.5 in vocabulary and 8.7 in reading comprehension. The mean initial grade equivalent of the average and above-average 8th graders was 9.0 in vocabulary and 9.2 in comprehension.

Since the pupils who were in the System program were all low-achievers in reading, and those not in the program were average or above, no comparative programmatic conclusions may be drawn. That is, the average and above-average pupils do not serve as a

"comparison" or "control" group for the below-average pupils. They are samples from different populations altogether. Hence, differences in reading growth between the samples are most likely due to differences in the basic characteristics of the two populations.

In order to synthesize an approximate comparison group of low reading achievers, teachers were asked to identify pupils who should have been in the program, but for various reasons were not. A total of 108 seventh graders and 63 eighth graders were thus identified. These identifications were subjective in nature, and often "after the fact." That is, many of these pupils were identified simply because they did not show what teachers anticipated as satisfactory growth as the year progressed. In other cases, their initial reading scores were considered accidentally low and proved to be so. In all cases, teachers made these identifications according to personal criteria of "need." Hence, it should be noted that these pupils do not constitute a definable comparison group in a classical research design sense. They are reported, nevertheless, for the interest of the participating teachers.

For the reasons described above, and also because of its retrospective nature, this present study should be regarded as a descriptive preliminary survey rather than a definitive comparative evaluation.

Treatment

Each school in the study administered the Reading System program, adapted to its own organizational pattern, to low reading achievers. In some grades and schools, low readers were placed in the program for the full year. They received from 30 to 130 hours of special reading instruction, with most in the interval from 45-65 hours. In other schools, several groups of low reading achievers were given 4-6 weeks of special instruction with each group having its turn (often referred to as "wheeling"). These pupils received about 12 hours of special instruction (2 hours per week for 6 weeks). In other schools, the reading teachers worked with the English teachers, providing a variety of other patterns of organization. Thus, no uniform procedure was followed which can be designated as the secondary extension of the Pinellas County Reading System. The predominant organizational pattern for each school is indicated in the appended tables of results.

Instruments

The Gates-MacGinitie Reading Surveys were used for the measurement of reading achievement. Pretesting was conducted in September, 1973, and post testing in April, 1974. In some cases, both the Vocabulary and Comprehension subtests were administered. In other cases, testing was restricted to the Comprehension subtest. Various levels of the survey also were

used for different groups, grades and schools. These levels are reported with the results for each grade and school.

The use of Survey Level D is of special note. Survey D is designed for use in grades 4-6. The survey designed for the grades included in this study is Survey E for grades 7-9. Survey D was used,nevertheless, for most low reading achievers because it corresponded to their achievement level.

There are two advantages to the use of tests which are "off-level" by grade, but appropriate to the pupil's level of achievement. The first is the greater accuracy which they provide in measuring achievement gains at either end of the achievement spectrum. When an "on-level" test is used for either very low or very high achievers, the test tends to be insensitive to growth. For the low achievers, the "floor" of the test may be above their range, both at the beginning and end of an instructional program. That is, they are unable to complete any part of the test with reasonable certainty in the pretest; and they are still unable to complete any part of it in the post test, even if they have made substantial gains within their own range. For these pupils, an on-level test is said to have too high a "floor."

A similar but reversed phenomenon occurs at the high end of the achievement spectrum. For high achieving pupils, an on-level test may be too easy to measure real gains because such pupils may achieve the maximum possible score, or near the maximum, in the pretest. In this situation, there is no

way to score higher in the post test, even if they have made gains above the level of the test. This is referred to as "topping out" in the pretest. It is also said that the test has too low a "ceiling."

A second advantage of using an off-level test is the improved psychological effect on the pupil. When a low achieving pupil is tested with an instrument appropriate to his achievement level, he does not feel overwhelmed or demeaned by its difficulty; nor does the high achieving pupil feel bored or demeaned by its simplicity.

A disadvantage of the use of off-level tests concerns the reliability of the conversion tables presented by the test publisher. These tables involve a natural margin of error in each conversion. The translation of an off-level score to an equivalent on-level score, however, requires a sequence of several conversions (not needed when on-level tests are used). The margin of error is thus increased. For the analyses conducted in this study, such multiple conversions were not utilized, thus avoiding this disadvantage.

Analytic Procedures

Three separate measures of growth are developed from the Gates-MacGinitie norm tables:

1. The first of these is the difference between the pre and post standard scores, using the pretest norms for both score conversions. This measure indicates absolute gain.

2. The second is the difference between the pre and post standard scores, using the pretest norms for the pretest score conversion and the post test norms for the post test score conversion. This measure shows relative gain. That is, it shows gain relative to the gain made by the norm group.
3. The third is the difference between the pre and post grade equivalents. Grade equivalents are subject to considerable inaccuracy at very high and very low levels for any test. (At the extreme levels, a single raw score point can mean a grade equivalent difference of as much as .5, or a half a year. This is due to the fact that the discriminative power of a test is greatest for the middle of the range of pupils for which it was designed. Outside of this range, the test provides only gross measurement.) For this study, however, the grade equivalent was the only common index available. Furthermore, it is the index which has the most direct meaning.

In order to interpret a gain in grade equivalent, some measure of expectation is desirable. The actual gain in grade equivalent then can be interpreted as high if it exceeds the expectation, or low if it falls short of it.

It is clear that pupils whose achievement levels are below their grade levels have not been gaining a full grade equivalent per year. (Pupils who have made a year's gain per year of schooling, are exactly on grade level.) A realistic expectation for low achievers, based on past performance, is therefore less than a year's gain. In this study, the elapsed time between pre and post testing was 7 months, or .7 school years. A normal expectation for the gain of low achieving readers in grade equivalent would be therefore something less than .7.

The following procedure was used to develop a quantitative index of expectation.

The entry grade equivalent was divided by the chronological grade, to arrive at an average yearly growth rate. For example, a beginning 8th grade pupil at grade equivalent 4.0 has had an average yearly growth rate of 4 ÷ 8 = .5 school years. (If non-promotion were taken into account, the computed yearly rate would be lower.)

This yearly rate was multiplied by .7, which was the interval between pre and post testing in this study. The resulting figure is the growth which could be expected based on past performance. For the example above, the figure is .5 x .7 = .35.

The computation of this "expectation index" is based on the assumption that the average yearly growth rate is constant. Since there is no evidence that academic gains are in fact constant, an expectation arrived at in this manner is a reference index rather than an empirical standard. Indeed, many pupils were selected for the Reading System program because it was suspected that they had ceased growing in reading achievement altogether. Some had been classified as "non-readers," even though they were in the 7th or 8th grade. For such pupils, any gain greater than zero can be interpreted as exceeding "expectation." The expectation index based on "average yearly growth" was used in this study and is presented in Table 1.

It also should be noted that the expectation index accepts the customary usage of a grade equivalent of 1.0 for a pupil who is only beginning school. It is reasonable to accept this usage, since it was similarly used by the test developer in the creation of the conversion tables.

Results

The gains of low achieving readers in the System programs are summarized in Table 1 on page 10. As reported in Table 1, low achievers in the 7th grade made a gain of 1.08 years in Vocabulary. This growth clearly exceeds the expectation index of .45. The corresponding gain in Comprehension was 1.01 years, clearly greater than the expectation index of .43.

For the low achieving readers in the 8th grade System programs, Table 1 shows a gain of .51 years in Vocabulary and .80 years in Comprehension. The .51 gain in Vocabulary does not differ appreciably from the .50 expectation index. The .80 gain in Comprehension exceeds the expectation index of .50, but not as markedly as does the corresponding 7th grade gain.

The reported gains should be regarded as estimates of the true gains rather than exact measurements. Table 2 presents "95% confidence intervals" for the true gains. Table 2 should be read as follows: the probability is 95% that the true gain in Vocabulary (estimated by 1.08) is within the interval from .90 to 1.26. Since the expected gain of .45 is less than the lower limit of this interval, the difference between 1.08 and .45 is significant. Each confidence interval can be interpreted in the same way. Table 2 shows that the observed gains are significantly greater than expected for 7th graders in both Vocabulary and Comprehension. Eighth graders show significantly greater gains than expected in Comprehension.

Table 3 reports the significance of the differences in gains between 7th and 8th graders. Table 3 should be read as follows: the probability is over 99% that the true gain of 7th graders exceeds the true gain of 8th graders in Vocabulary. The corresponding probability is over 96% for Comprehension.

TABLE 1

Mean Grade Equivalent Gains vs. Expectations

for Low-Achieving Pupils in Special Reading System Instruction

	n	Observed Gain	Expectation Index
7th Grade			
Vocabulary	377	1.08	.45
Comprehension	539	1.01	.43
8th Grade			
Vocabulary	339	.51	.50
Comprehension	339	.80	.50

TABLE 2

95% Confidence Intervals for Mean Grade Equivalent Gains
For Low-Achieving Pupils in Special Reading System Instruction

	Observed Gain	95% Confidence Interval	Expectation Index
7th Grade			
Vocabulary	1.08	[.90 ≤ G ≤ 1.26]	.45
Comprehension	1.01	[.90 ≤ G ≤ 1.12]	.43
8th Grade			
Vocabulary	.51	[.38 ≤ G ≤ .64]	.50
Comprehension	.80	[.63 ≤ G ≤ .97]	.50

TABLE 3

Test of Significance of the Differences in Mean Grade Equivalent Gains

Between Low-Achieving 7th and 8th Grade Pupils

In Special Reading System Instruction

	n	Observed Gain	t-test of Difference*	Probability of Significance
Vocabulary				
7th Grade	377	1.08	t = 4.9	> 99%
8th Grade	339	.51		
Comprehension				
7th Grade	539	1.01	t = 2.1	> 96%
8th Grade	339	.80		

* G. Glass, & J. Stanley. Statistical Methods in Education and Psychology. Englewood Cliffs, N.J.: Prentice-Hall, 1970.

The gains of average and high-achieving readers are summarized in Table 4 on the following page. As reported in Table 4, average and high-achievers in the 7th grade showed a gain of .68 years in Vocabulary. This observed growth is slightly less than the expectation index of .74. The gain in Comprehension was 1.27 years, clearly greater than the expectation index of .85.

For the average and high-achieving readers in the 8th grade, Table 4 shows a gain of .73 years in Vocabulary and 1.12 years in Comprehension. The .73 gain in Vocabulary is slightly less than the .78 expectation index. The 1.12 gain in Comprehension exceeds the expectation index of .80.

These reported gains also should be regarded as estimates of the true gains rather than exact measurements. Table 5 presents "95% confidence intervals" for the true gains. Table 5 should be read as follows: the probability is 95% that the true gain in Vocabulary (estimated by .68) is within the interval from .51 to .85. Since the expected gain of .74 lies within this interval, the difference between .68 and .74 is not significant. On the other hand, the probability is 95% that the true gain in Comprehension (estimated by 1.27) is within the interval from 1.14 to 1.40. Since the expected gain of .85 is less than the lower limit of this interval, the difference between 1.27 and .85 is significant. Each confidence interval can be interpreted in the same way. Table 5 shows that the observed gains are significantly greater than the expectation indices for both grades in Comprehension, but not in Vocabulary.

TABLE 4

Mean Grade Equivalent Gains vs. Expectations
for Average and High-Achieving Pupils in Regular Instruction

	n	Observed Gain	Expectation Index
7th Grade			
Vocabulary	350	.68	.74
Comprehension	790	1.27	.85
8th Grade			
Vocabulary	89	.73	.78
Comprehension	472	1.12	.80

TABLE 5

95% Confidence Intervals for Mean Grade Equivalent Gains

For Average and High-Achieving Pupils in Regular Instruction

	Observed Gain	95% Confidence Interval	Expectation Index
7th Grade			
Vocabulary	.68	[.51 $\leq$ G $\leq$ .85]	.74
Comprehension	1.27	[1.14 $\leq$ G $\leq$ 1.40]	.85
8th Grade			
Vocabulary	.73	[.42 $\leq$ G $\leq$ 1.04]	.78
Comprehension	1.12	[.97 $\leq$ G $\leq$ 1.27]	.80

Included in the Appendix are results for each group within each grade and school. The tables in the Appendix show raw scores and standard scores (computed in two ways, as explained under Analytic Procedures), as well as confidence intervals for the gains in grade equivalent.

Summary and Conclusions

The results of this study indicate that low achieving pupils have made fluctuating but significant gains beyond normal expectations in reading in the various Systems programs. These gains cannot be attributed causally to the programs because of the lack of control groups. Nevertheless, the results justify the tentative conclusion that at least some of the gains over and above expectations reflect the program's impact. A definitive conclusion must be deferred until a more highly controlled study is conducted.

It also appears that pupils of average and above average reading ability are performing consistently with normal expectation in Vocabulary, and in excess of normal expectation in Comprehension.

APPENDIX

Results for Individual Schools

The critical reader will note that a simple subtraction of the pretest from the post test means often results in a gain slightly different from that reported. This occurs because the pretest, post test and calculated difference scores were independently rounded from the computer output.

Table 6

Mean Reading Scores of Pupils Who Were In Special Reading System Instruction*

Pupils: Low-achieving
Grade: 7
School: Largo Jr. High
Test: Survey D, Form M
Normal grade level of test: 4 - 6
n = 162

	Comprehension (52 items)		
	Pre-test	Post-test	Gain
Raw score	28.09	35.07	6.98
Standard score			
by pre-norms only	42.92	48.45	5.53
by pre and post-norms	42.92	45.98	3.06
Grade equivalent	4.77	6.03	[1.26]

Standard error (S.E.) of the gain in grade equivalent .08
Margin for 95% confidence interval (1.96 x S.E.) .16

95% confidence interval around true gain (G) $[1.10 \leq G \leq 1.42]$

*throughout school year (for most pupils 80 hours)

Table 7

Mean Reading Scores of Pupils Who Were In Special Reading System Instruction*

Pupils: Low-achieving
Grade: 8
School: Largo Jr. High
Test: Survey D, Forms 1M and 2M
Normal grade level use of test: 4 - 6
n = 132

	Vocabulary (50 items)		
	Pre-test	Post-test	Gain
Raw score	26.64	28.56	1.92
Standard score			
by pre-norms only	44.89	47.26	2.37
by pre and post-norms	44.89	44.47	-.42
Grade equivalent	5.31	5.82	[.51]

Standard error (S.E.) of the gain in grade equivalent .11
Margin for 95% confidence interval (1.96 x S.E.) .22

95% confidence interval around true gain (G) [.29 ≤ G ≤ .73]

	Comprehension (52 items)		
	Pre-test	Post-test	Gain
Raw score	30.90	36.72	5.82
Standard score			
by pre-norms only	45.38	50.74	5.36
by pre and post-norms	45.38	48.20	2.82
Grade equivalent	5.42	6.75	[1.34]

Standard error (S.E.) of the gain in grade equivalent .15
Margin for 95% confidence interval (1.96 x S.E.) .29

95% confidence interval around true gain (G) [1.05 ≤ G ≤ 1.63]

*throughout school year (for most pupils 65 - 80 hours)

Table 8

Mean Reading Scores of Pupils Who Were In Regular Instruction

Pupils: Average and high-achieving
Grade: 7
School: Largo Jr. High
Test: Survey D (Form M)
Normal grade level use of test: 4 - 6
n = 204

	Comprehension (52 items)		
	Pre-test	Post-test	Gain
Raw score	44.67	47.45	2.77
Standard score			
by pre-norms only	58.50	63.56	5.05
by pre and post-norms	58.50	61.07	2.56
Grade equivalent	9.15	10.31	[1.15]

Standard error (S.E.) of the gain in grade equivalent .14
Margin for 95% confidence interval (1.96 x S.E.) .27

95% confidence interval around true gain (G) $[.88 \leq G \leq 1.42]$

Table 9

Mean Reading Scores of Pupils Who Were In Regular Instruction

Pupils: Average and high-achieving
Grade: 7
School: Largo Jr. High
Test: Survey E (Form M)
Normal grade level use of test: 7 - 9
n = 236

	Comprehension (52 items)		
	Pre-test	Post-test	Gain
Raw score	36.66	42.14	5.48
Standard score			
by pre-norms only	56.09	62.48	6.39
by pre and post-norms	56.09	61.08	4.99
Grade equivalent	9.27	10.69	[1.42]

Standard error (S.E.) of the gain in grade equivalent .10
Margin for 95% confidence interval (1.96 x S.E.) .20

95% confidence interval around true gain (G) $[1.22 \leq G \leq 1.62]$

Table 10

Mean Reading Scores of Pupils Who Were In Regular Instruction

Pupils: Average and high-achieving
Grade: 8
School: Largo Jr. High
Test: Survey E, Form 1
Normal grade level of test: 7 - 9
n = 383

	Comprehension (50 items)		
	Pre-test	Post-test	Gain
Raw score	39.53	42.99	3.46
Standard score			
by pre-norms only	54.17	58.63	4.46
by pre and post-norms	54.17	56.82	2.64
Grade equivalent	9.39	10.54	[1.15]

Standard error (S.E.) of the gain in grade equivalent	.08
Margin for 95% confidence interval (1.96 x S.E.)	.16
95% confidence interval around true gain (G)	$[.99 \leq G \leq 1.31]$

Table 11

Mean Reading Scores of Pupils Who Were in Regular Instruction

Pupils: Low-achieving
Grade: 7
School: Largo Jr. High
Test: Surveys D, E (Form M)
Normal grade level use of test: 4 - 9
n = 29

	Comprehension (52 items)		
	Pre-test	Post-test	Gain
Raw score	29.10	31.03	1.93
Standard score			
by pre-norms only	45.41	47.00	1.59
by pre and post-norms	45.41	45.14	-.28
Grade equivalent	5.43	5.78	[.36]

Standard error (S.E.) of the gain in grade equivalent .28
Margin for 95% confidence interval (1.96 x S.E.) .55

95% confidence interval around true gain (G) $[-.19 \leq G \leq .91]$

Table 12

Mean Reading Scores of Pupils Who Were In Special Reading System Instruction*

Pupils: Low-achieving
Grade: 7
School: 16th St. Jr. High
Test: Gates Reading Survey (early edition)
Normal grade level of test: 4 - 10
n = 175

	Vocabulary (60 items)		
	Pre-test	Post-test	Gain
Raw score	22.65	25.38	2.73
Grade equivalent	5.28	5.80	[.52]

Standard error (S.E.) of the gain in grade equivalent .10
Margin for 95% confidence interval (1.96 x S.E.) .20

95% confidence interval around true gain (G) [.32 ≤ G ≤ .72]

	Comprehension (43 items)		
	Pre-test	Post-test	Gain
Raw score	16.52	20.79	4.27
Grade equivalent	5.16	6.09	[.94]

Standard error (S.E.) of the gain in grade equivalent .10
Margin for 95% confidence interval (1.96 x S.E.) .20

95% confidence interval around true gain (G) [.74 ≤ G ≤ 1.14]

*six week sessions (for most pupils 12 hours)

Table 13

Mean Reading Scores of Pupils Who Were In Special Reading System Instruction*

Pupils: Low-achieving
Grade: 7
School: 16th St. Jr. High
Test: Gates Reading Survey (early edition)
Normal grade level of test: 4 - 10
n = 30

	Vocabulary (60 items)		
	Pre-test	Post-test	Gain
Raw score	21.27	24.47	3.20
Grade equivalent	4.86	5.44	[.58]

Standard error (S.E.) of the gain in grade equivalent .22
Margin for 95% confidence interval (1.96 x S.E.) .43

95% confidence interval around true gain (G) [.15 ≤ G ≤ 1.01]

	Comprehension (43 items)		
	Pre-test	Post-test	Gain
Raw score	17.30	20.67	3.37
Grade equivalent	5.26	5.90	[.65]

Standard error (S.E.) of the gain in grade equivalent .24
Margin for 95% confidence interval (1.96 x S.E.) .47

95% confidence interval around true gain (G) [.18 ≤ G ≤ 1.12]

*throughout school year (for most pupils 130 hours)

Table 14

Mean Reading Scores of Pupils Who Were In Special Reading System Instruction*

Pupils: Low achieving
Grade: 8
School: 16th St. Jr. High
Test: Gates Reading Survey (early edition)
Normal grade level of test: 4-10
n = 141

	Vocabulary (60 items)		
	Pre-test	Post-test	Gain
Raw score	30.93	33.19	2.26
Grade equivalent	6.89	7.43	[.54]

Standard error (S.E.) of the gain in grade equivalent .12
Margin for 95% confidence interval (1.96 x S.E.) .24

95% confidence interval around true gain (G) [.30 ≤ G ≤ .78]

	Comprehension (43 items)		
	Pre-test	Post-test	Gain
Raw score	25.16	26.18	1.03
Grade equivalent	7.05	7.45	[.40]

Standard error (S.E.) of the gain in grade equivalent .13
Margin for 95% confidence interval (1.96 x S.E.) .25

95% confidence interval around true gain (G) [.15 ≤ G ≤ .65]

*six week sessions (for most pupils 12 hours)

Table 15

Mean Reading Scores of Pupils Who Were In Regular Instruction

Pupils: Average and high-achieving
Grade: 7
School: 16th St. Jr. High
Test: Gates Reading Survey (early edition)
Normal grade level of test: 4 - 10
n = 103

	Vocabulary (60 items)		
	Pre-test	Post-test	Gain
Raw score	36.73	38.82	2.10
Grade equivalent	7.95	8.50	[.54]

Standard error (S.E.) of the gain in grade equivalent .15
Margin for 95% confidence interval (1.96 x S.E.) .29

95% confidence interval around true gain (G) [.25 ≤ G ≤.83]

	Comprehension (43 items)		
	Pre-test	Post-test	Gain
Raw score	28.56	31.49	2.93
Grade equivalent	7.84	8.69	[.85]

Standard error (S.E.) of the gain in grade equivalent .17
Margin for 95% confidence interval (1.96 x S.E.) .33

95% confidence interval around true gain (G) [.52 ≤ G ≤ 1.18]

Table 16

Mean Reading Scores of Pupils Who Were in Regular Instruction

Pupils: Average and high-achieving
Grade: 8
School: 16th St. Jr. High
Test: Gates Reading Survey (early edition)
Normal grade level of test: 4 - 10
n = 89

Vocabulary (60 items)

	Pre-test	Post-test	Gain
Raw score	40.70	43.94	3.25
Grade equivalent	9.00	9.73	[.73]

Standard error (S.E.) of the gain in grade equivalent .16
Margin for 95% confidence interval (1.96 x S. E.) .31

95% confidence interval around true gain (G) [.42 ≤ G ≤ 1.04]

Comprehension (43 items)

	Pre-test	Post-test	Gain
Raw score	32.91	34.27	1.36
Grade equivalent	8.63	9.64	[1.00]

Standard error (S.E.) of the gain in grade equivalent .20
Margin for 95% confidence interval (1.96 x S.E.) .39

95% confidence interval around true gain (G) [.61 ≤ G ≤ 1.39]

Table 17

Mean Reading Scores of Pupils Who Were In Regular Instruction

Pupils: Low-achieving
Grade: 7
School: 16th St. Jr. High
Test: Gates Reading Survey (early edition)
Normal grade level of test: 4 - 10
n = 40

	Vocabulary (60 items)		
	Pre-test	Post-test	Gain
Raw score	22.47	26.25	3.78
Grade equivalent	5.06	5.90	[.84]

Standard error (S.E.) of the gain in grade equivalent .26
Margin for 95% confidence interval (1.96 x S.E.) .51

95% confidence interval around true gain (G) $[.33 \leq G \leq 1.35]$

	Comprehension (43 items)		
	Pre-test	Post-test	Gain
Raw score	14.18	22.35	8.18
Grade equivalent	4.47	6.20	[1.73]

Standard error (S.E.) of the gain in grade equivalent .25
Margin for 95% confidence interval (1.96 x S.E.) .49

95% confidence interval around true gain (G) $[1.24 \leq G \leq 2.22]$

Table 18

Mean Reading Scores of Pupils Who Were In Regular Instruction

Pupils: Low-achieving
Grade: 8
School: 16th St. Jr. High
Test: Gates Reading Survey (early edition)
Normal grade level of test: 4 - 10
n = 51

	Vocabulary (60 items)		
	Pre-test	Post-test	Gain
Raw score	24.51	29.27	4.76
Grade equivalent	5.41	6.38	[.97]

Standard error (S.E.) of the gain in grade equivalent .23
Margin for 95% confidence interval (1.96 x S.E.) .45

95% confidence interval around true gain (G) $[.52 \leq G \leq 1.42]$

	Comprehension (43 items)		
	Pre-test	Post-test	Gain
Raw score	20.04	23.57	3.53
Grade equivalent	5.56	6.46	[.90]

Standard error (S.E.) of the gain in grade equivalent .21
Margin for 95% confidence interval (1.96 x S.E.) .41

95% confidence interval around true gain (G) $[.49 \leq G \leq 1.31]$

Table 19

Mean Reading Scores of Pupils Who Were In Special Reading System Instruction*

Pupils: Low-achieving
Grade: 7
School: Azalea Middle
Test: Surveys B, C, D
Normal grade level use of test: 2 (B); 3 (C); 4 - 6 (D)
n = 57

	Vocabulary (48 - 52 items)		
	Pre-test	Post-test	Gain
Raw score	24.02	26.77	2.75
Standard score			
by pre-norms only	42.86	45.72	2.86
by pre and post-norms	42.86	41.53	- 1.33
Grade equivalent	3.77	4.31	[.54]

Standard error (S.E.) of the gain in grade equivalent .10
Margin for 95% confidence interval (1.96 x S.E.) .20

95% confidence interval around true gain (G) [.34 ≤ G ≤ .74]

	Comprehension (34 - 52 items)		
	Pre-test	Post-test	Gain
Raw score	21.96	24.95	2.98
Standard score			
by pre-norms only	40.33	43.72	3.39
by pre and post-norms	40.33	39.23	- 1.11
Grade equivalent	3.28	3.75	[.46]

Standard error (S.E.) of the gain in grade equivalent .13
Margin for 95% confidence interval (1.96 x S.E.) .25

95% confidence interval around true gain (G) [.21 ≤ G ≤ .71]

*throughout school year (for most pupils 38 hours)

Table 20

Mean Reading Scores of Pupils Who Were In Special Reading System Instruction*

Pupils: Low-achieving
Grade: 8
School: Azalea Middle
Test: Surveys B, C, D
Normal grade level use of test: B (2); C (3); D (4 - 6)
n = 60

Vocabulary (48 - 52 items)

	Pre-test	Post-test	Gain
Raw score	28.50	30.88	2.38
Standard score			
by pre-norms only	47.25	49.60	2.35
by pre and post-norms	47.25	44.77	- 2.48
Grade equivalent	4.44	4.84	[.41]

Standard error (S.E.) of the gain in grade equivalent .12
Margin for 95% confidence interval (1.96 x S.E.) .24

95% confidence interval around true gain (G) [.17 ≤ G ≤ .65]

Comprehension (34-52 items)

	Pre-test	Post-test	Gain
Raw score	27.92	30.97	3.05
Standard score			
by pre-norms only	46.10	48.50	2.40
by pre and post-norms	46.10	44.42	- 1.68
Grade equivalent	3.98	4.46	[.48]

Standard error (S.E.) of the gain in grade equivalent .12
Margin for 95% confidence interval (1.96 x S.E.) .24

95% confidence interval around true gain (G) [.24 ≤ G ≤ .72]

*throughout school year (for most pupils 45 - 67 hours)

Table 21

Mean Reading Scores of Pupils Who Were In Special Reading System Instruction*

Pupils: Low-achieving
Grade: 7
School: Madeira Beach Jr. High
Test: Survey E
Normal grade level use of test: 7 - 9
n = 115

	Vocabulary (50 items)		
	Pre-test	Post-test	Gain
Raw score	11.04	17.77	6.73
Standard score			
by pre-norms only	35.80	45.27	9.47
by pre and post norms	35.80	43.26	7.46
Grade equivalent	3.93	6.25	[2.32]
Standard error (S.E.) of the gain in grade equivalent			.20
Margin for 95% confidence interval (1.96 x S.E.)			.39
95% confidence interval around true gain (G)			[1.93 ≤ G ≤ 2.71]

	Comprehension (52 items)		
	Pre-test	Post-test	Gain
Raw score	15.43	20.56	5.12
Standard score			
by pre-norms only	31.56	37.59	6.03
by pre and post norms	31.56	36.04	4.48
Grade equivalent	3.07	4.21	[1.14]
Standard error (S.E.) of the gain in grade equivalent			.17
Margin for 95% confidence interval (1.96 x S.E.)			.33
95% confidence interval around true gain (G)			[.81 ≤ G ≤ 1.47]

*throughout school year (for most pupils 40 - 45 hours)

Table 22

Mean Reading Scores of Pupils Who Were In Regular Instruction

Pupils: Average and high-achieving
Grade: 7
School: Madeira Beach Jr. High
Test: Survey E
Normal grade level use of test: 7 - 9
n = 247

	Vacabulary (50 items)		
	Pre-test	Post-test	Gain
Raw score	20.74	22.89	2.15
Standard score			
by pre-norms only	49.45	52.14	2.70
by pre and post-norms	49.45	50.10	.65
Grade equivalent	7.28	8.02	[.74]
Standard error (S.E.) of the gain in grade equivalent			.11
Margin for 95% confidence interval (1.96 x S.E.)			.22
95% confidence interval around true gain (G)			[.52 ≤ G ≤ .96]

	Comprehension (52 items)		
	Pre-test	Post-test	Gain
Raw score	35.00	39.36	4.36
Standard score			
by pre-norms only	52.77	57.47	4.70
by pre and post-norms	52.77	56.13	3.36
Grade equivalent	7.99	9.38	[1.39]
Standard error (S.E.) of the gain in grade equivalent			.12
Margin for 95% confidence interval (1.96 x S.E.)			.24
95% confidence interval around true gain (G)			[1.15 ≤ G ≤ 1.63]

Table 23

Mean Reading Scores of Pupils Who Were In Regular Instruction

Pupils: Low-achieving
Grade: 7
School: Madeira Beach Jr. High
Test: Survey E
Normal grade level use of test: 7 - 9
n = 39

	Vocabulary (50 items)		
	Pre-test	Post-test	Gain
Raw score	12.56	13.97	1.41
Standard score			
by pre-norms only	38.46	40.38	1.92
by pre and post-norms	38.46	38.26	- .21
Grade equivalent	4.50	4.97	[.47]

Standard error (S.E.) of the gain in grade equivalent .29
Margin for 95% confidence interval (1.96 x S.E.) .57

95% confidence interval around true gain (G) [- .10 ≤ G ≤ 1.04]

	Comprehension (52 items)		
	Pre-test	Post-test	Gain
Raw score	20.23	22.51	2.28
Standard score			
by pre-norms only	38.26	40.38	2.13
by pre and post-norms	38.26	39.18	1.03
Grade equivalent	4.04	4.66	[.62]

Standard error (S.E.) of the gain in grade equivalent .27
Margin for 95% confidence interval (1.96 x S.E.) .53

95% confidence interval around true gain (G) [.09≤ G ≤ 1.15]